REMARKS

In the Office Action issued December 21, 2005, claims 6-13 were rejected under 35 U.S.C. §112, ¶2, as being indefinite. Claims 5-13, and 17 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Claims 1-17 were rejected under 35 U.S.C. §102(b) as being anticipated by an article by Chen et al. entitled "Merging R-trees: Efficient Strategies for Local Bulk Insertion" (hereinafter "Chen"). Claims 2 and 12 were objected to as lacking antecedent basis. Claims 5, 13, and 17 were objected to as being of improper dependent form.

Claims 1, 3-4, 6-12, 14-16, and 18-20 are now pending in this application. Claim 1 has been amended to include the subject matter of claim 2 and claim 2 has been canceled. Claim 12 has been amended to correct the antecedent basis. Claim 6 has been amended in order to correct the rejection under U.S.C. §112, ¶2. Claims 5, 13, and 17 have been canceled and new claims 18-20 have been added in order to correct the dependent form. New claims 18-20 recite "tangible computer-readable medium" in order to claim statutory subject matter. No new matter has been added.

The applicant respectfully submits that the present invention, according to claims 1-17 (now 1, 3-4, 6-12, 14-16, and 18-20) is not anticipated by Chen. Chen discloses bulk loading of data into multidimensional index structures using a technique called STLT (for small-tree-large-tree), which considers the new dataset as an R-tree itself (small tree), identifies and prepares a suitable location in the original R-tree (large tree) for insertion. and lastly performs the insert of the small tree into the large tree. The problem with the technique disclosed by Chen is that the constructed subtrees (small trees) and the target tree (large tree) could have overlapping nodes resulting in poor quality of the index. This could lead to poor

performance of subsequent queries. Chen recognizes this problem, but does not disclose or suggest the claimed technique of the present invention for dealing with this problem.

Regarding claims 1, 3-4, 6-12, 18, and 19, the present invention, for example, according to claim 1 requires selecting subsets of the index that overlap if the entries are inserted into the subsets of the index. Chen does not disclose or suggest selecting subsets that would overlap. Rather, Chen merely recognizes that insertion of the small tree can lead to overlap and that less overlap produces better search performance:

> The aim of any loading algorithm should be to maintain an efficient structure of the R-tree so as to keep the cost of answering the queries as low as possible. The R-tree shows good search performance if the search query causes traversals of only a few paths. This is more likely to occur if the sibling MBRs at each of the levels have less overlap between them. Also, as indicated earlier, it is important to load new data into the R-tree as fast as possible. Thus, the goals of our proposed technique are both to minimize the loading time and to produce an R-tree with a good search performance. (Chen, page 9, para. 2, emphasis added)

Nowhere does Chen disclose or suggest purposefully selecting subsets that would overlap, as is required by the present invention.

Further, Chen does not disclose or suggest reorganizing the subsets of the index with the inserted entries, wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in a strict subset of the index is reduced, as is required, for example, by claim 1. Chen does disclose adjusting the tree, however, Chen never

discloses or suggest adjusting the tree in order to reduce overlap. Rather, Chen discloses "attempt[ing] some local reorganization of the large tree in order to assure that the small tree can be inserted in one operation" (See page 14, para. 1), and to handle overflow, which is the situation in which the attempt to insert the small tree into the large tree fails because there is not enough room in the large tree (See page 14, para. 2 and page 29, para. 4). Chen provides no disclosure or suggestion of reorganizing or adjusting the tree in order to reduce the overlap (overflow and overlap are completely different).

Regarding claims 14-16 and 20, the present invention, for example, according to claim 14, requires partitioning the clustered children and the entries into a plurality of groups, wherein at least one of the groups includes a child node of the cluster node, a buddy child node associated the child node, and one or more of the entries, said partition is performed so that overlap among bounding boxes associated with the groups is reduced.

Chen does not disclose or suggest reorganizing the subsets of the index with the inserted entries, wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in a strict subset of the index is reduced, as is required, for example, by claim 14. Chen does disclose adjusting the tree, however, Chen never discloses or suggest adjusting the tree in order to reduce overlap. Rather, Chen discloses "attempt[ing] some local reorganization of the large tree in order to assure that the small tree can be inserted in one operation" (See page 14, para. 1), and to handle overflow, which is the situation in which the attempt to insert the small tree into the large tree fails because there is not enough room in the large tree (See page 14, para. 2 and page 29, para. 4). Chen provides no disclosure or suggestion of reorganizing or adjusting the tree in order to reduce the overlap (overflow and overlap are completely different).

Therefore, the present invention according to claim 1, and according to claims 18 and 19, which are similar to claim 1, and according to claims 3-4, 6-12, which depend from claim 1, and according to claim 14, and according to claim 20, which is similar to claim 14, and according to claim 15, which depends from claim 14, is not anticipated by Chen.

Each of the claims now pending in this application is believed to be in form for allowance. Accordingly, favorable reconsideration of this case and early issuance of the Notice of Allowance are respectfully requested.
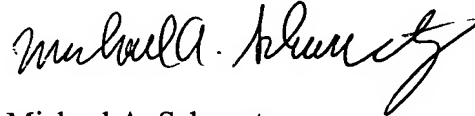
Additional Fees:

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with this application to Deposit Account No. 19-5127 (19111.0247).

Conclusion

In view of the foregoing, all of the Examiner's rejections to the claims are believed to be overcome. The Applicants respectfully request reconsideration and issuance of a Notice of Allowance for all the claims remaining in the application. Should the Examiner feel further communication would facilitate prosecution, he is urged to call the undersigned at the phone number provided below.

Respectfully Submitted,

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